1/19/96

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 19 1996

OFFICE OF
PREVENTION, PESTICIDES, AND
TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Myclobutanil Section 18 for Watermelons in Arizona

TO: Meredith Johnson, PM 41
Registration Division (7505C)

FROM: Anthony F. Maciorowski, Chief
Ecological Effects Branch
Environmental Fate and Effects Division (7507C)

6.19.96

The Arizona Department of Agriculture has applied for a Section 18 Emergency Exemption for the use of Rally 40W fungicide (myclobutanil) to control powdery mildew on watermelons in Yuma County, Arizona. The intended acreage is 850 acres, with a total use of 510 lb myclobutanil. The EEB has reviewed this request, and does not anticipate any adverse effects to terrestrial or aquatic wildlife from the proposed use.

If you have any questions on the above, please contact Kathryn Montague (308-2804).

2014200

ECOLOGICAL EFFECTS BRANCH REVIEW

Chemical: Myclobutanil (Rally 40W)

100 Submission Purpose and Label Information

100.1 Submission Purpose and Pesticide Use

The Arizona Department of Agriculture is applying for an emergency exemption for Rally 40W (myclobutanil) fungicide to control powdery mildew on watermelons in Yuma County. The active ingredient of the formulation is myclobutanil (40%).

100.2 Formulation Information

Myclobutanil:a-butyl-a-(4-chlorophenyl)-1H-1,2,4-triazole-1-propane-nitrile. 40%
Inert Ingredients 60%

100.3 Application Methods, Directions, Rates (from label)

Begin applications at first sign of disease development and continue on a 7 to 10 day application schedule. Application rate is 4 oz product (1.6 oz ai)/A. Do not apply more than 1.5 lbs product (0.6 lbs ai/a) per season. Limited to 6 applications per season. Total area to be treated is 850 acres, for a total of 510 lbs ai used. Use is limited to Yuma Country, AZ, only. All applications of Rally 40W Agricultural Fungicide on watermelons must be documented on Form 1080 written by either a pest control advisor, farm owner or farm manager. All applicable directions, restrictions and precautions on the EPA registered label are to be followed.

100.4 Target Organisms

Powdery mildew (*Sphaerotheca fuliginea*).

100.5 Precautionary Labeling

For terrestrial uses, do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water by cleaning of equipment or disposal of wastes. Do not apply when weather conditions favor drift from area treated.

101 Hazard Assessment

101.1 Likelihood of Adverse Effects to Nontarget Organisms

Environmental Fate Data:

- Stable to hydrolysis at pH 5, 7, and 9
- Stable to photolysis in water
- Photolytic soil half-life = 143 days
- Aerobic soil half-life = 66 days
- Anaerobic soil half-life = no degradation at 62 days
- solubility = 142 ppm
- Leaching: myclobutanil is moderately mobile (K_ds = 1.46 -

9.77 for adsorption and 0.47 - 4.18 for desorption in 5 soils). K_{oc} = 112. The degradate is considered highly mobile.

- Bioaccumulation: Fish bioaccumulation study was waived. Myclobutanil is not expected to bioaccumulate.

The major route of dissipation is believed to be diffusion and dilution; myclobutanil appears to be resistant to most environmental breakdown processes.

Toxicity Data

Terrestrial Species

BIRDS: Ecological effects avian toxicity data for myclobutanil are as follows:

Guide-line #	MRID	Species	Study Type	% a.i.	Results	Status
71-1	0144286	Bobwhite	Acute oral LD_{50}	84.5	510 mg/kg	Core
71-2a	0144287	Bobwhite	Dietary LC_{50}	84.5	>5000 ppm	Core
71-2b	0144287	Mallard	Dietary LC_{50}	84.5	>5000 ppm	Core
71-4a	430879-01	Bobwhite	Reproduction	94.2	NOEC=260ppm	Supplemental
71-4b	430879-02	Mallard	Reproduction	94.2	NOEC=260ppm	Supplemental

Myclobutanil is slightly toxic to birds on an acute basis, and practically non-toxic to birds on a sub-acute (dietary) basis.

MAMMALS: Mammalian toxicity data for myclobutanil is as follows:

Guideline	MRID	Species	Test type	% a.i.	Results	Classification
81-1	266077	rat	acute oral	91.9	LD_{50}=1360 g/kg	core
83-4		rat	2-gen. reproduction	84.5	Repro NOEL = 200 ppm, LOEL = 1000 ppm	core
83-4		rat	2-gen reproduction	84.5	systemic NOEL = 50 ppm, LOEL = 200 ppm	core

Myclobutanil is slightly toxic to mammals on an acute basis.

Aquatic Species

Aquatic toxicity data for myclobutanil is as follows:

Guideline	MRID	Species	Test type	% a.i.	Results	Status
72-1a	0144285	Bluegill sunfish	96-hr acute	84.5	LC_{50}=2.4 ppm	core
72-1c	0141677	Rainbow trout	96-hr acute	84.5	LC_{50}=4.2 ppm	core
72-2	0141678	Daphnid	48-hr acute	84.5	EC_{50}= 11 ppm	core
72-3a	427479-03	Sheepshead minnow	96-hr acute	93	LC_{50} = 4.7 ppm	core
72-3b	427479-01	Eastern oyster	96-hr acute	93	EC_{50}= 0.68 ppm	supplemental
72-3c	427479-02	Mysid	96-hr acute	93	LC_{50}=0.24 ppm	core
72-4a	0266119	Fathead minnow	Early life stage		NOEC = 0.98 ppm, LOEC = 2.2 ppm	supplemental

Myclobutanil is moderately toxic to freshwater fish and invertebrates, moderately toxic to marine fish, and highly toxic to marine invertebrates on an acute basis.

Exposure Data and Risk Quotients (RQs)

Acute terrestrial exposure estimates were made using the Kenaga nomograph. Values were derived based on the maximum label rate per acre per application (0.1 lb a.i./A). Values were also calculated for 6 applications at 0.1 lb ai/A on a 7-10 day application interval using the FATE program. Values presented below are the maximum estimated residues for various vegetation types. RQ values were derived by dividing the estimated exposure by the LC_{50} value. RQs greater than 0.5 exceed the Agency's Level-of-Concern (LOC) for high risk; values greater than 0.2 indicate a risk which may be reduced if mitigation measures are instituted; values greater than 0.1 exceed the LOC for endangered species.

Chronic risk was assessed using the residues generated by the FATE program and comparing them to the available avian reproduction data. An RQ greater than 1 exceeds the Agency's LOC for high risk.

Vegetation Type	Max. Kenaga value (0.1 lb ai/A)	Acute RQ	Max. FATE EEC (6 appl., total of 0.6 lb ai/A)	Reproduction RQ
Short Grass	24 ppm	0.03	121 ppm	0.5
Long Grass	11 ppm	0.00		
Leaves/leafy crops	12.5 ppm	0.00	63 ppm	0.3
Forage/Insects	5.8 ppm	0.00		
Pods/seeds	1.2 ppm	0.00		
Fruit	0.7 ppm	0.00	3.5 ppm	0.02

There were no LOC exceedances for avian species from the proposed use of myclobutanil. This use is not expected to cause concern for avian species.

Terrestrial Species-Mammals

Acute: Based on acute LC_{50} values, mammals are less sensitive than birds to myclobutanil. Since acute risk to birds is not expected from the proposed use of myclobutanil, acute risk to mammals is not expected.

Chronic: Maximum residues calculated via the FATE program are lower than reproductive NOECs for mammalian species. Therefore, reproductive risk is not expected for the proposed use of myclobutanil.

Aquatic Organisms

Exposure estimates (EECs) and RQs

The aquatic EECs presented below were generated using the GENEEC computer program developed by EFGWB. This program uses a variety of environmental fate parameters in conjunction with the application rate to estimate the exposure to aquatic organisms from runoff. The maximum total application rate (0.6 lb a.i./A) was used in this program, since little degradation would occur during the 7-day application interval for multiple applications. The printout from this program is attached at the end of this review.

Acute RQs were derived by dividing the instantaneous EEC by the LC or EC_{50} value for each species. The Agency's LOC for high-risk is exceeded if the RQ value is greater than 0.5. Values of 0.2 and higher indicate risk that is potentially mitigatable, and values greater than 0.05 exceed the LOC for endangered species.

Chronic RQs were derived by dividing the appropriate EEC by the NOEC obtained in chronic tests. The 21-day EEC is used for aquatic invertebrates, and the 60-day EEC is used for fish (using the early life-stage NOEC). Note that there is no acceptable chronic data available for invertebrates, so the chronic invertebrate RQ could not be generated for this risk assessment.

	EEC (ppb)	RQ
Instantaneous	23.5	Bluegill: 0.01 Trout: 0.00 Daphnid: 0.00 Shpshd. minnow: 0.00 Oyster: 0.03 Mysid: 0.10[1]
56-day	22.0	Fathead minnow: 0.02

[1]Exceeds the endangered species LOC

No high-risk LOCs were exceeded for the proposed use of myclobutanil. The mysid RQ exceeds the LOC for endangered species; however, there is not expected to be exposure to marine/estuarine invertebrates from the proposed use on watermelons in Yuma County, Arizona.

Plants
Tier II Testing
Terrestrial
Tier II terrestrial plant testing is unavailable for myclobutanil.

Aquatic
Tier II aquatic plant data is available for *Selenastrum capricornutum* only. The *Selenastrum* EC_{50} value is 0.83 ppm. No adverse effects to aquatic plants are expected, based on this value.

Discussion of RQs/LOC exceedance
A. **Effects on terrestrial organisms:**
ACUTE
Based on the acute toxicity data, myclobutanil does not appear to pose an acute risk to avian or mammalian species from the proposed use.

CHRONIC
The proposed use of myclobutanil does not appear to pose a reproductive concern to birds or mammals.

B. **Effects on aquatic organisms:**
ACUTE
Fish: Based on the acute toxicity data, myclobutanil should not pose an acute concern to freshwater or marine/estuarine fish from the proposed use.

Invertebrates: The endangered species LOC was exceeded for marine/estuarine invertebrates; however, exposure to this class of organisms is not expected from the proposed use. The proposed use of myclobutanil does not pose an acute concern to freshwater aquatic invertebrates.

CHRONIC
Fish: The proposed use of myclobutanil does not appear to pose a chronic risk to fish.

Invertebrates: Chronic risk to aquatic invertebrates could not be assessed at the present time due to a lack of data.

C. **Effects on plants:**
Terrestrial: A risk assessment for terrestrial plants could not be completed at this time due to a lack of data.

Aquatic: Based on the single aquatic plant species for which data was available, the proposed use of myclobutanil does not appear to pose a risk to aquatic plants.

101.4 Adequacy of Toxicity Data

The available data were adequate to complete a risk assessment for this particular use. However, for other uses of myclobutanil, the following data requirements are outstanding:

71-4: Avian reproduction
72-4b: Aquatic Invertebrate life-cycle (marine species)
123-1: Terrestrial plant Tier II testing
123-2: Tier II aquatic plant testing (remaining 4 species)

101.5 Adequacy of Labeling

Environmental hazards labeling is adequate for use under this registration.

102 Conclusions

EEB has completed a risk assessment for the use of myclobutanil on watermelons in Yuma County, Arizona. No adverse effects to terrestrial or aquatic species are anticipated from the proposed use.

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water photol t½ = Stable

RUN No. 1 FOR myclobutanil INPUT VALUES

APPLIC RATE (LBS/ACRE)	FIELD HALF-LIFE (DAYS)	SOIL KOC	SOLUBILITY (PPM)	% SPRAY DRIFT	INCORP DEPTH(IN)
.600	66.0	112.0	1200.0	1.0	.0

STANDARD POND HALFLIFE VALUES (DAYS)

HYDROLYSIS HALFLIFE	PHOTOLYSIS HALFLIFE(EFF)	METABOLIC HALFLIFE	COMBINED POND HALFLIFE
.00	.00	.00	*******

GENERIC EECs (IN PPB)

INSTANTANEOUS GEEC	AVERAGE 4 DAY GEEC	AVERAGE 21 DAY GEEC	AVERAGE 56 DAY GEEC
23.47	23.40	23.03	22.43

soil photolysis t½ = 143

RUN No. 2 FOR myclobutanil INPUT VALUES

APPLIC RATE (LBS/ACRE)	FIELD HALF-LIFE (DAYS)	SOIL KOC	SOLUBILITY (PPM)	% SPRAY DRIFT	INCORP DEPTH(IN)
.600	66.0	112.0	1200.0	1.0	.0

STANDARD POND HALFLIFE VALUES (DAYS)

HYDROLYSIS HALFLIFE	PHOTOLYSIS HALFLIFE(EFF)	METABOLIC HALFLIFE	COMBINED POND HALFLIFE
.00	740.74	.00	740.74

GENERIC EECs (IN PPB)

INSTANTANEOUS GEEC	AVERAGE 4 DAY GEEC	AVERAGE 21 DAY GEEC	AVERAGE 56 DAY GEEC
23.47	23.37	22.81	21.87

DAILY ACCUMULATED PESTICIDE RESIDUES---MULTP. APPL.

Chemical name	Myclobutanil--grass
Initial concentration (ppm)	24
Half-life	66
A number of application	6
Application interval	7
Length of simulation (day)	90

DAY	RESIDUE (PPM)
0	24
1	23.74927
2	23.50115
3	23.25563
4	23.01267
5	22.77225
6	22.53434
7	46.29892
8	45.81523
9	45.33658
10	44.86294
11	44.39424
12	43.93044
13	43.47149
14	67.01733
15	66.31718
16	65.62435
17	64.93875
18	64.26031
19	63.58897
20	62.92464
21	86.26725
22	85.36599
23	84.47415
24	83.59163
25	82.71833
26	81.85413
27	80.99899
28	104.1528
29	103.0647
30	101.9879
31	100.9224
32	99.86806
33	98.82469
34	97.79226
35	120.7706
36	119.5089
37	118.2603
38	117.0248
39	115.8022
40	114.5924
41	113.3952
42	112.2106
43	111.0383

44	109.8782
45	108.7303
46	107.5944
47	106.4703
48	105.358
49	104.2573
50	103.1681
51	102.0902
52	101.0237
53	99.96826
54	98.92385
55	97.89038
56	96.86769
57	95.85568
58	94.85425
59	93.86328
60	92.88266
61	91.91229
62	90.95206
63	90.00187
64	89.06159
65	88.13113
66	87.21041
67	86.2993
68	85.39771
69	84.50553
70	83.62268
71	82.74905
72	81.88455
73	81.02908
74	80.18255
75	79.34486
76	78.51591
77	77.69564
78	76.88393
79	76.0807
80	75.28587
81	74.49934
82	73.72103
83	72.95084
84	72.18871
85	71.43453
86	70.68823
87	69.94973
88	69.21895
89	68.4958
90	67.78021
Maximum residue ----------	120.7706
Average residue ----------	80.91695

DAILY ACCUMULATED PESTICIDE RESIDUES---MULTP. APPL.

Chemical name ----------	Myclobutanil-leaf
Initial concentration (ppm) -----	12.5
Half-life ----------	66
A number of application --------	6
Application interval ----------	7

Length of simulation (day) ----- 90

DAY	RESIDUE (PPM)
0	12.5
1	12.36941
2	12.24018
3	12.11231
4	11.98577
5	11.86055
6	11.73664
7	24.11402
8	23.8621
9	23.6128
10	23.36611
11	23.122
12	22.88044
13	22.6414
14	34.90486
15	34.5402
16	34.17935
17	33.82227
18	33.46892
19	33.11926
20	32.77325
21	44.93086
22	44.46146
23	43.99696
24	43.53731
25	43.08246
26	42.63236
27	42.18698
28	54.24623
29	53.67951
30	53.11871
31	52.56376
32	52.01461
33	51.4712
34	50.93347
35	62.90135
36	62.2442
37	61.59392
38	60.95043
39	60.31367
40	59.68355
41	59.06002
42	58.44301
43	57.83243
44	57.22824
45	56.63037
46	56.03874
47	55.45328
48	54.87395
49	54.30067
50	53.73337
51	53.172
52	52.6165
53	52.0668
54	51.52284

55	50.98457
56	50.45192
57	49.92484
58	49.40325
59	48.88713
60	48.37639
61	47.87099
62	47.37087
63	46.87597
64	46.38625
65	45.90164
66	45.42208
67	44.94755
68	44.47798
69	44.01329
70	43.55348
71	43.09846
72	42.6482
73	42.20265
74	41.76174
75	41.32544
76	40.89371
77	40.46648
78	40.04371
79	39.62537
80	39.21139
81	38.80174
82	38.39636
83	37.99523
84	37.59829
85	37.20548
86	36.81679
87	36.43215
88	36.05154
89	35.6749
90	35.30219

Maximum residue ----------	62.90135
Average residue ----------	42.14426

DAILY ACCUMULATED PESTICIDE RESIDUES---MULTP. APPL.

Chemical name ----------	Myclobutanil--fruit
Initial concentration (ppm) -----	.7
Half-life ----------	66
A number of application --------	6
Application interval ----------	7
Length of simulation (day) -----	90

DAY	RESIDUE (PPM)
0	.7
1	.692687
2	.6854502
3	.6782891
4	.6712028
5	.6641906

DAILY ACCUMULATED PESTICIDE RESIDUES---MULTP. APPL.

Chemical name ----------	Myclobutanil--fruit
Initial concentration (ppm) -----	.7
Half-life ----------	66
A number of application --------	6
Application interval ----------	7
Length of simulation (day) -----	90

DAY	RESIDUE (PPM)
0	.7
1	.692687
2	.6854502
3	.6782891
4	.6712028
5	.6641906
6	.6572516
7	1.350385
8	1.336277
9	1.322317
10	1.308502
11	1.294832
12	1.281304
13	1.267918
14	1.954672
15	1.934251
16	1.914043
17	1.894047
18	1.874259
19	1.854678
20	1.835302
21	2.516128
22	2.489842
23	2.463829
24	2.438089
25	2.412618
26	2.387412
27	2.362471
28	3.037789
29	3.006053
30	2.974647
31	2.943571
32	2.912818
33	2.882387
34	2.852274
35	3.522476
36	3.485675
37	3.449259
38	3.413224
39	3.377565
40	3.342279
41	3.307361
42	3.272808
43	3.238617

44	3.204781
45	3.1713
46	3.138169
47	3.105384
48	3.072941
49	3.040837
50	3.009069
51	2.977632
52	2.946524
53	2.915741
54	2.885279
55	2.855136
56	2.825307
57	2.795791
58	2.766582
59	2.737679
60	2.709078
61	2.680775
62	2.652768
63	2.625055
64	2.59763
65	2.570491
66	2.543637
67	2.517063
68	2.490766
69	2.464745
70	2.438995
71	2.413514
72	2.388299
73	2.363348
74	2.338658
75	2.314225
76	2.290048
77	2.266123
78	2.242448
79	2.21902
80	2.195838
81	2.172897
82	2.150196
83	2.127733
84	2.105504
85	2.083507
86	2.06174
87	2.040201
88	2.018886
89	1.997794
90	1.976923
Maximum residue ----------	3.522476
Average residue ----------	2.360078